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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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STEPHEN B. ACKERMAN	
28 DAVIS AVENUE	
POUGHKEEPSIE, NY 12603	

EXAMINER	
KAYRISH, MATTHEW	

ART UNIT	PAPER NUMBER
2627	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/706,381

Applicant(s)

DOVEK ET AL.

Examiner

Matthew G. Kayrish

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/18/2007 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 4 and 6 have been considered but are moot in view of the new grounds of rejection; arguments with respect to confusion in claims 5-10 have been resolved to read in a clearer manner.

Applicant's arguments filed 5/8/2007 with respect to claim 10 have been fully considered but they are not persuasive. Takano clearly states " $t_2=0.5\text{ }\mu\text{m}$ " which is further supported in figure 14. The structure is etched such that the throat " t_2 " is $0.5\text{ }\mu\text{m}$. Therefore, claim 10 remains rejected. It should be noted that the motivation in the previous Office Action, dated 3/14/2007, did in fact refer to a full paragraph. The motivation has been further narrowed to specifically point to the exact lines to limit further confusion. Furthermore, the combination is not based upon the structure of Takano's lower pole, but about the depth of the etch in the lower pole of Takano, and providing the same depth to the lower pole of Santini '848 and Santini '809. For these reason, claim 10 remains rejected as previously presented.

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Claim 4 has been amended; claims 1-3 have been canceled; claims 4-10 remain pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Santini (US Patent Number 6172848), in view of Santini (US Patent Number 6130809).

Regarding claim 4, Santini '848 discloses:

A magnetic write head, comprising:

On a substrate (figure 21AD, inherently below item S1), a first layer of high magnetic permeability material (figure 21AD, item P1B), having an edge whose surface is normal to said substrate (figure 21AD, front edge of P1B is normal to bottom surface of S1), that serves as a primary lower magnetic pole (figure 21AD, item P1B/S2);

A first non-magnetic layer (figure 21B, item 608, unlabeled in figure 21AD) that contacts said first layer only at said edge and extends away therefrom (figure 21AD, item 608 contacts item P1B/S2 at edge and extends away therefrom), said non-magnetic layer having a top surface that is coplanar with that of said primary pole (figure 21AD have a coplanar top surface);

A second layer of high magnetic permeability that serves as a secondary lower pole (figure 21AD, item P1T);

A field coil over (figure 21AD, item 625), and insulated from (via figure 21U item 626, unlabeled in figure 21AD), said lower poles;

An upper magnetic pole that overlies said field coil (figure 21AD, item P2T), contacts said lower pole at a second side that is opposite to said first side (figure 21AD, item 638), and that is separated from said ledge by a second layer of non-magnetic material that is a write gap (figure 21F, item 614, unlabeled in figure 21AD), said upper pole having, at the write gap, a width equal to said ledge width (figure 21AC), whereby it defines a track width (columns 2 & 3, lines 64-67 & 1-4).

Santini '848 fails to specifically disclose:

Wherein the secondary lower pole fully covers said primary pole and said non-magnetic layer above which it serves as a ledge having a width;

Said ledge extending away from said primary lower pole by an amount.

Santini '809 discloses:

A lower pole on said first side (figure 16, item 230) as a ledge having a width (figure 17, item 234 begins to widen);

Said ledge extending away from said non-magnetic layer by an amount (figure 18, "pole tip").

Santini '809 fails to specifically disclose:

Wherein the secondary lower pole fully covers said primary pole and said non-magnetic layer on said first side as a ledge having a width;

However, by replacing the pole layer [figure 21AD, item P1T] of Santini `848 with the pole layer [figure 17, item 202] of Santini `809, it can be seen that the pole layer will fully cover the entire top surface of the first pole layer [P1B/S1], and also the top of the non-magnetic layer, which is under the first pole layer. Furthermore, as can be seen, the surfaces are flush at the front end in figure 21AD or Santini `848, therefore, the pole [202] of Santini `809 placed in the head of Santini `848 will be flush at the front surface of [P1B/S1], and the tip [230] will protrude from the front surface.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the pole tip layer of Santini `848 with the pole tip layer of Santini `809 because this tip layer will properly define the track width, as stated in column 12, lines 1-5.

Regarding claim 6, Santini `848 and Santini `809 disclose the features of base claim 4, as stated in the 103 rejection above; Santini `848 further disclosing:

Wherein said non-magnetic layer is silicon oxide, aluminum oxide, tantalum oxide, Al, Rh, Ru, Cu, NiCu, or Ta (column 3, lines 7-10).

Claims 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Santini `848 and Santini `809, as applied to claim 4 above, and further in view of Sasaki et al (US Publication Number 2003/0151849).

Regarding claim 5, Santini `848 and Santini `809 disclose the features of base claim 4 as noted in 103 rejection above, but fail to specifically disclose:

Wherein said first layer of high magnetic permeability material is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.3 and 3 microns.

Sasaki disclose:

Wherein said first layer of high magnetic permeability material is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.3 and 3 microns (page 9, paragraph 124).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to fabricating the pedestal from this material with this thickness, because this thickness helps to increase the magnetic flux density, but these materials have a relatively low saturation level, therefore, the magnetic flux density is under more strict control for accurately recording data.

Regarding claim 7, Santini '848 and Santini '809 disclose the features of base claim 4 as noted in 103 rejection above, but fail to specifically disclose:

Wherein said second layer of high magnetic permeability material is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.2 and 2 microns.

Sasaki disclose:

Wherein said second layer of high magnetic permeability material (paragraph 125, item 42) is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.2 and 2 microns (page 9, paragraph 125).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to fabricate the second layer to a general thickness relatively near that of the first layer, because this will provide for better interaction between the two layers which allows for a more accurate and precise control of the magnetic flux density.

Regarding claim 8, Santini '848 and Santini '809 disclose the features of base claim 4 as noted in 103 rejection above, but fail to specifically disclose:

Wherein said upper magnetic pole is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.3 and 3 microns.

Sasaki disclose:

Wherein said upper magnetic pole is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.3 and 3 microns (page 11, paragraph 136).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to fabricating the pedestal from this material with this thickness, because this thickness helps to increase the magnetic flux density, but these materials have a relatively low saturation level, therefore, the magnetic flux density is under more strict control for accurately recording data.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Santini '848 and Santini '809, as applied to claim 4 above, and further in view of Komuro et al (US Patent Number 6530141).

Regarding claim 9, Santini `848 and Santini `809 disclose the features of base claim 4 as noted in 103 rejection above, but fail to specifically disclose:

Wherein said track width is between about 0.05 and 1 micron.

Komuro discloses:

Wherein said track width is between about 0.05 and 1 micron (column 6, lines 1-3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the head of Santini `848 and Santini `809 with a track width of the given width, as taught by Komuro, because this provides for a large recording density.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Santini `848 and Santini `809, as applied to claim 4 above, and further in view of Takano et al (US Patent Number 5850326).

Regarding claim 10, Santini `848 and Santini `809 disclose the features of base claim 4 as noted in 103 rejection above, but fail to specifically disclose:

Wherein said amount that said ledges extend away from said poles is between about 0.1 and 1 micron.

Takano discloses:

Wherein said amount that said ledges extend away from said poles is between about 0.1 and 1 micron (figure 14, column 11, lines 39-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the ledges [230] of Santini '848 and Santini '809 extend from the poles between about .1 and 1 micron, as taught by Takano, because this allows for accurately use focused ion beaming, which will make the recording of the signal stronger and more accurate, as stated by Takano in column 11, lines 47-49.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew G. Kayrish whose telephone number is 571-272-4220. The examiner can normally be reached on 8am - 5pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>.
Should you have questions on access to the Private PAIR system, contact the
Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew G. Kayrish

8/30/2007

MGK


8/30/07

**Brian E. Miller /Brian E. Miller/
Primary Patent Examiner AU2627**